

**EVALUATION OF FUNGICIDE APPLICATIONS FOR CONTROL OF TARGET SPOT IN NC****Tim Britton****Guy D. Collins****Lindsey D. Thiessen****Keith L. Edmisten****North Carolina State University****Raleigh, NC****Abstract**

Target spot is a foliar disease in cotton that occurs sporadically and occasionally in North Carolina and is difficult to predict. This disease can eventually cause defoliation of lower leaves and can decrease yield. Yield losses are thought to occur when the disease begins early in the bloom period with high disease incidence and rapid progression, resulting in premature defoliation of leaves while development of harvestable bolls remains in progress (2018 UGA Cotton Production Guide). In some cases, the use of fungicides may be warranted to prevent the disease from becoming established or to slow the rate of progression. Target spot is thought to be more problematic in irrigated conditions or in years with frequent and intense rainfall, high soil moisture retention, in fields with a history of the disease, in reduced-tillage systems, and in taller/full-season varieties with rank growth (2018 UGA Cotton Production Guide). Research was conducted during 2017 & 2018 in North Carolina in a field with a history of severe target spot, to evaluate fungicide applications for controlling this disease and impacts on yield. The objectives of this research were to investigate the effects of Target spot in cotton in a wet-natured field with a history of severe disease pressure when planted to a susceptible variety, and to investigate the effects of fungicide application on disease incidence, progression, and yield, and to determine how many fungicide applications may be needed to effectively control this disease.

Replicated trials were conducted at the Tidewater Research Station near Plymouth NC during 2017 and 2018. The field site consisted of a high organic matter soil with a shallow water table as is commonly observed in the Blacklands region of NC. This particular field experienced very high Target spot incidence and pressure during August and September of 2016 in a separate cotton research trial. As field history may influence subsequent disease incidence, this research trial was purposefully conducted in this field. Treatments consisted of a Non-Treated Control where no fungicide was applied, Priaxor applied at 4 oz/A at both the first and third week of bloom, and Priaxor applied at 4 oz/A at only the third week of bloom. Percent incidence of Target Spot was collected during late September or October, shortly prior to defoliation. This trial was managed in a manner to promote rank growth, which is thought to be another promoter of this disease. Cotton was allowed to grow uninhibited in a high moisture environment with a susceptible, full-season variety known for aggressive growth potential. Plant growth regulator applications were intentionally delayed until mid-bloom so that plant height was taller than is typically ideal for cotton production in this region.

Plant height was taller than ideal for this region in both years (approximately 50 to 60 inches tall), however plant height accompanied by a lush dense canopy was ideal for disease development. Although the incidence and severity of Target Spot was high in 2016 (greater than 70 percent incidence) in the same field, the incidence of the disease was relatively low in 2017 (dry weather during late summer...less than 9 percent in 2017). Wet conditions in August and September of 2018 resulted in approximately 50 percent incidence in 2018. In 2017 (dry weather in late summer), there was no effect of fungicide application on incidence of Target spot or yield. In 2018 (wetter conditions in late summer), fungicide applications reduced defoliation however there was no effect on yield.

In conclusion, although the 2016 season resulted in prevalent and significant Target Spot in this particular field, there was very little disease present in 2017, but noticeably more in 2018, suggesting that prevailing weather may have a greater influence on disease development than field history in NC. Additionally, tall cotton with a lush, dense canopy was achieved in both years of this experiment, also suggesting that rank plant growth may not consistently result in this disease in NC if wet conditions do not occur. Most importantly, prophylactic applications of fungicides may not be justified for managing this disease in NC, unless the disease becomes more common or predictable. Additional research in multiple environments, later application timings when symptoms first appear, and in irrigated and reduced-tillage fields needs to be conducted in order to adequately develop management strategies and to determine if and when fungicide applications are justified to prevent yield loss.

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### **References**

UGA Cotton Production Guide (<http://www.ugacotton.com/vault/file/2018-UGA-COTTON-PRODUCTION-GUIDE-1.pdf>)